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Applicant: Fufang Zha et al.
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For: SCOURING METHOD
Examiner: Sorkin, David L.
Art Unit: 1723

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8(a)

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Commissioner for Patents

APPELLANT'S REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41(a)(1)

This Reply Brief is submitted in response to the Examiner's Answer mailed April 7, 2009 in the above-referenced application.

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I. Reply Brief Identification

Appellant:	Fufang Zha et al.
U.S. Serial No.:	10/759,560
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Title:	SCOURING METHOD
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II. Status of Claims (37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-20 were pending in the application as filed on January 15, 2004. Claim 1 was amended in an Amendment filed on March 27, 2006. In an Amendment filed on November 8, 2006, claims 1 and 4 were amended. Claims 1-20 currently stand rejected, with claim 1 being in independent form. A Pre-Appeal Brief Request for Review was filed on November 12, 2008. Claims 1-20 are appealed herein.

III. Grounds of Rejection to Be Reviewed on Appeal (37 C.F.R. § 41.37(c)(1)(vi))

A. Whether each of claims 1, 3, 4, 7-15, 17, 19 and 20 is patentable under 35 U.S.C. § 103(a) over Uchida et al. (JP 61-167407) (English translation previously submitted) (hereinafter “Uchida”) in view of Meyer (US 3,791,631) (hereinafter “Meyer”).

B. Whether each of claims 1-20 is patentable under 35 U.S.C. § 103(a) over Geary (US 3,442,002) (hereinafter “Geary”) in view of Uchida, and further in view of Meyer.

IV. ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii))

For the reasons provided below, the Examiner's rejections are improper and should be reversed. Each of claims 1-20, as presented, is allowable.

A. Each of Claims 1, 3, 4, 7-15, 17, 19 and 20 is Patentable over Uchida in view of Meyer

Claims 1, 3, 4, 7-15, 17, 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchida et al. (JP 61-167407) (English translation previously submitted) (hereinafter "Uchida") in view of Meyer (US 3,791,631) (hereinafter "Meyer").

As acknowledged in the Examiner's Answer, Uchida fails to disclose, teach or suggest a method for forming at least one opening in a membrane pot comprising, in part, providing a mould for potting a membrane end, the mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot, and raising the ejector portion to demould the membrane pot, as recited in independent claim 1.

The process disclosed by Uchida for producing a hollow-fiber filtration membrane module was detailed in Appellant's Opening Brief which emphasized that, as best understood, container 9 of Uchida is intended to be an integral component of the completed filtration module and is therefore not a mould as presently recited. In contrast to the method of claim 1, therefore, Uchida fails to disclose providing a mould, let alone a mould having a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot. Uchida is therefore also silent as to raising an ejector portion to demould the membrane pot.

There has been no suitable objective evidence provided that there exists any motivation in Uchida to modify Uchida with Meyer. While an obviousness determination does not require rigid application of a suggestion/teaching/motivation test, this does not mean that a reason to make a modification need not be present in the prior art. See Takeda Chem. Indus., Ltd. v. Alphapharm Pty., Ltd., 492 F.3d 1350 (Fed. Cir. 2007) citing KSR Int'l. Co. v. Teleflex, Inc., 127 S. Ct. 1727, 1745-46 (2007) (acknowledging the importance of identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed invention does" in an obviousness determination). A patent "composed of

several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” KSR Int’l Co., 127 S. Ct. at 1741.

One skilled in the art would not have modified container 9 of Uchida to provide a mould including an ejector portion as asserted in the Examiner’s Answer because Uchida’s method does not involve demoulding. The proposed modification would impermissibly change a basic principle of how the Uchida process was designed to operate, namely formation of a filtration module without demoulding. Container 9 cannot be a mould as presently recited because Uchida does not teach a step of demoulding the filtration module after curing. The rejection of independent claim 1 therefore contains a clear error because the Examiner misidentified an element in the citation relied upon. In context, container 9 is intended to be an integral component of the filtration module prepared by Uchida instead of serving as a mould. In at least one embodiment, for example, container 9 of Uchida is an acrylic resin container which is filled with an epoxy resin to form the filtration module by bonding and cross-linking. (Uchida translation, Brief Explanation of FIG. 2.) Nor does Uchida contemplate a demoulding step. While Uchida specifies that removable rods/tubes 11 inserted to form the throughholes include a nonstick or releasable surface treatment, no such disclosure is made regarding the material of container 9. (Uchida translation, page 4, third full paragraph.)

In improperly equating container 9 of Uchida with the presently claimed mould, the Examiner’s Answer places undue emphasis on FIG. 1 of Uchida, asserting that container 9 is “clearly absent” in the final module product illustrated therein and that it can “only mean that the module product has been removed from the mould.” (Examiner’s Answer at pages 3 and 7.) It is notable that FIG. 1 is intended to provide a cross-section of a disclosed filtration device in its entirety, rather than to offer any detailed view of a final potted portion thereof. (See Uchida translation, page 2, last paragraph.) FIG. 1 is a mere representation and is not dispositive regarding the nature and role of container 9, particularly in view of the specification taken as a whole. See In re Hedges, 783 F.2d 1038, 1041 (Fed. Cir. 1986) (“[T]he prior art as a whole must be considered. The teachings are to be viewed as they would have been viewed by one of ordinary skill). The Examiner’s inference that Uchida teaches demoulding is therefore not persuasive because it is based wholly on a comparison between roughly sketched schematics.

Paradoxically, the Examiner's Answer first states that FIG. 1 "can only mean that the module product has been removed from the mold" while later stating in the same paragraph that "not removing the cured resin is an *alternative* mentioned at the middle of page 4 of the translation." (Examiner's Answer at page 7.) In doing so, the Examiner's Answer mischaracterizes the statement at page 4 of Uchida, that "[it] is also possible to use the housing 4 shown in Figure 1 as a container after installing a bottom on one end," as teaching an alternative to demoulding. This statement when read in context only teaches that a modified housing 4 is an alternative to container 9 in the disclosed membrane potting process, presumably so that container 9 does not need to be receivable by the housing 4 when a completed module is installed for operation. It is an improper leap to take that one sentence and use it to characterize the remainder of the reference, including figures, as primarily teaching a demoulding process. (Examiner's Answer at page 7.) Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443 (Fed. Cir. 1986) (A single line in a prior art reference should not be taken out of context and relied upon with the benefit of hindsight to show obviousness.)

Upon reading Uchida, one skilled in the art would not have modified the Uchida process by including an extra step of demoulding, as taught by Meyer. Meyer is representative of various conventional manufacturing processes which include a demoulding step. The fact that Meyer discloses raising an ejector to demould a polymer resin product is inapposite. Uchida is directed to assembling, rather than demoulding, an integral filtration module. Without any motivation to demould, there would have been no motivation to provide a mould, let alone a mould with an ejector portion, as presently recited. The impropriety of the proffered combination highlights the fact that the Examiner's Answer sets about to construct the patented method using hindsight rather than reading the references for what they teach in determining whether the claimed invention is obvious. Ruiz v. A.B. Chance Co., 357 F.3d 1270 (Fed. Cir. 2004) ("[H]indsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result – often the very definition of invention. Section 103 precludes this hindsight discounting of the value of new combinations by requiring assessment of the invention as a whole.")

As such, independent claim 1 is patentable over Uchida and Meyer, either alone or in combination. Claims 3, 4, 7-15, 17, 19 and 20 depend directly or indirectly from claim 1 and are patentable for at least the same reasons.

B. Each of Claims 1-20 is Patentable over Geary in view of Uchida and Meyer

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Geary (US 3,442,002) (hereinafter “Geary”) in view of Uchida, and further in view of Meyer.

The process of manufacturing a fluid separation apparatus taught by Geary was detailed in Appellant’s Opening Brief. Geary fails to disclose, teach, or suggest a method for forming at least one opening in a membrane pot comprising, in part, providing a mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot, and raising the ejector portion to demould the membrane pot, as recited in independent claim 1.

In contrast to the assertions presented in the Examiner’s Answer, there has been no suitable objective evidence provided that there exists any motivation in Geary to modify Geary so as to provide openings in the membrane pot, let alone to provide openings in the membrane pot in the manner taught by Uchida. In contrast to Geary, Uchida fails to disclose use of a mold or a demolding step and therefore operates under principles inapplicable to Geary. Thus, one skilled in the art would not have modified the Geary mold to incorporate features of the non-removable potting cylinder of Uchida. Furthermore, one skilled in the art would not have modified the Geary method to provide openings in the membrane pot using removable rods/tubes that fit in base holes as taught by Uchida because the setup would be unlikely to withstand the centrifugal force applied during the Geary process.

One skilled in the art would also not have modified the base of Geary’s mold unit 905b to include an ejector portion, as taught by Meyer, because such a modification would unnecessarily complicate the design of mold unit 905b. Mold unit 905b is already easily removed from casing assembly 101 via bolts 906 to release cast wall member 950. Nor would an ejector portion be necessary to place openings in the membrane pot, as evidenced by Uchida, assuming *arguendo* that such a modification to Geary would be desirable as asserted in the Office Action. Because

the mold of Geary is bolted to the casing assembly containing the filaments, the proposed modification would improperly require substantial reconstruction and redesign of structural elements disclosed by Geary to operably incorporate an ejector portion in the mold base.

The rejection involves clear error because there is no suggestion to combine the teachings and suggestions of Geary, Uchida and Meyer, as advanced by the Examiner, apart from improperly using Applicant's invention as a template through a hindsight reconstruction of Applicant's claims. Upon reading Geary, one skilled in the art would not have been motivated to modify its teaching to provide openings in the membrane pot as taught by Uchida, and would also not have been motivated to eject the membrane pot in the manner taught by Meyer. See Innogenetics, N.V. v. Abbott Labs., 512 F.3d 1363 (Fed. Cir. 2008) citing Graham v. John Deere Co., 383 U.S. 1, 36 (1966) (discussing "the importance of guarding against hindsight... and resist[ing] the temptation to read into the prior art the teachings of the invention in issue").

As such, independent claim 1 is patentable over the cited combination. Claims 2-20 depend directly or indirectly from independent claim 1 and are therefore patentable for at least the same reasons.

C. Summary

In view of the above, each of the rejections is improper and should be reversed. Appellant respectfully requests reversal of the rejections and issuance of a Notice of Allowance.

V. Claims Appendix (37 C.F.R. § 41.37(c)(1)(viii))

1. (Previously Presented) A method for forming at least one opening in a membrane pot, the method comprising:

providing at least one membrane, the membrane having at least one membrane end;

providing a mould for potting the membrane end, the mould comprising a base comprising an ejector portion and at least one formation for forming at least one opening in the membrane pot;

filling the mould with a curable potting material;

positioning the membrane end in the mould;

allowing the potting material to at least partially cure, whereby the membrane ends are secured in the membrane pot; and

raising the ejector portion to demould the membrane pot, the membrane pot having at least one opening.

2. (Original) The method of claim 1, further comprising:

mounting the mould on a vertically movable platform.

3. (Original) The method of claim 1, wherein the formation comprises at least one upstanding pin mounted in a base of the mould.

4. (Previously Presented) The method of claim 1, wherein raising the ejector portion comprises raising a central ejector portion of the base.

5. (Original) The method of claim 1, further comprising:

heating the mould to assist curing of the curable potting material.

6. (Original) The method of claim 1, further comprising:

centrifuging the mould to assist penetration of the curable potting material into membrane fiber walls.

7. (Original) The method of claim 1, further comprising:

fitting a guide or collar around a periphery of the mould.

8. (Original) The method of claim 1, wherein the mould comprises a base having a plurality of upstanding pins.

9. (Original) The method of claim 8, wherein the upstanding pins are sized and distributed for correct gas bubble distribution.

10. (Original) The method of claim 1, further comprising:

positioning a plurality of membrane ends in the mould, wherein the membranes comprise hollow fiber membranes.

11. (Original) The method of claim 10, wherein the membrane ends are positioned uniformly in the mould.

12. (Original) The method of claim 10, further comprising:

sealing the membrane ends.

13. (Original) The method of claim 10, wherein the membrane ends are uniformly distributed in relation to at least one opening.

14. (Original) The method of claim 10, further comprising:

positioning the membranes in a sleeve that holds the membranes; and

inserting the membranes into a guide or collar around a periphery of the mould.

15. (Original) The method of claim 10, wherein filling the mould with a curable potting material is conducted prior to positioning the membrane ends in the mould.

16. (Original) The method of claim 10, further comprising:

fanning the membrane ends prior to positioning the membrane ends in the mould.

17. (Original) The method of claim 10, further comprising:

trimming the membrane ends to provide a uniform membrane length.

18. (Original) The method of claim 10, further comprising:

cutting the membrane pot transversely to open the membrane ends to facilitate withdrawal of filtrate from lumens during operation.

19. (Original) The method of claim 10, further comprising:

positioning a plurality of membrane ends in the mould so as to form an array.

20. (Original) The method of claim 19, wherein the array is a cylindrical array.

VI. Conclusion

For the reasons provided above, the rejections are improper and should be reversed. Appellant respectfully requests reversal of the rejections and issuance of a Notice of Allowance.

If there is any additional fee occasioned by this filing, including an extension fee that is not covered by an accompanying payment, please charge any deficiency to Deposit Account No. 50/2762, Ref. No. M2019-701440.

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